

REMARKS

Claims 1 to 13 are now in this application under examination.

Claims 1 to 13 are all rejected under 35 USC 102(e) or 35 USC 103(a) as allegedly being unpatentable over Perry US Publication 2003/015955 (filed 22 Feb. 2002) alone or in combination with a secondary reference Ishizuka or Haack.

Since the principal reference, Perry, does not teach what the present applicants are doing and actually teaches away from the presently claimed method, the undersigned attorney will explain the differences. Please note that the undersigned attorney prepared and filed Perry (cited) and well understands the inventions in both Perry and the present application.

At the time Perry was filed it was known that large diamonds would not clog with sawn material as fast as small diamonds. The analogy is similar to large grit sandpaper as opposed to fine grit sandpaper that clogs faster.

Perry proposed using large diamonds with small diamonds in a nickel matrix. In fact the large diamonds are so large as to have the same diamond protruding from both sides of the thin wall matrix. The Perry method in Fig. 15 cited clearly states at block (step) 54 that plating in the second bath stops while the large diamonds are still exposed. See also Fig. 16 cited at step 61. The last steps 56 and 63 etch nickel matrix metal from the bottom (smooth side) so that points of the same diamonds as seen on top are exposed at the bottom side.

Contrasted thereto, the applicants use a single plating bath with small to medium super abrasive friable particles that are encapsulated and bonded in the matrix. As pointed out at page 13, lines 3 to 5, when the deposited blade is

removed from the mandrel (steps 54, 62 Figs. 12, 13) the blade is finished and usable.

The applicants in Claim 1 include the step of grinding one side of the saw blade to achieve parallelism and near perfect balance..As pointed out at page 13, ~~15~~ to 13 this grinding allows high speed initial use without run in.

One reason applicants chose to include this last grinding step is because their exposed particles could be ground. It is impossible to grind diamonds. If the examiner is inclined to reject claims 1 on Perry he should note that protruding diamonds cannot be ground. Further, Perry is inoperable without a second plating bath of small diamonds. Further, Perry prefers to remove a bottom layer of nickel or copper as an added step.

In Fig. 6 the applicants show and describe what happens to diamonds 35 (or even very hard, super-abrasive particles). They wear and form rounded surfaces 36 which cause the particles to heat

up and tear loose from their matrix.

Figs. 8 and 9 describe how a friable hard super abrasive crystal works. The cutting edges are constantly breaking and fracturing on friable fault lines but do not tear loose as shown in Fig. 7 where prior art diamonds were used. Thus, the new saw blade is both self-sharpening and self-cleaning. The prior art blade shown in Fig. 7 must be dressed to eliminate clogging and dull particles.

Dependent Claim 1 calls for making a balanced self-cleaning singulation saw blade. The Perry blade does neither.

Claim 1 calls for "a deposited solution" and "friable particles". Perry teaches away from friable particles and makes no mention of such particles. Clearly Figs. 15 and 16 cited and Perry's claims call for diamonds that cause crystal pull out (see applicants' Fig. 7).

Claim 1 calls for depositing "metal" - "greater than the desired thickness of the saw blade". Perry does not do this. His metal deposit is thinner than the large diamonds which are exposed and extend from the top layer.

Claim 1 calls for "grinding" one side of the saw blade to obtain parallelism. Perry does not do this. Perry cannot grind diamonds even if he desired to do so! In fact, Perry was never concerned with the advantages of using softer particles than diamonds which allow grinding and high speed balance before run-in. See applicant's Summary of the Invention at pages 2-5 of the applicants' specification.

The applicants point out in their specification that their friable super abrasive particles are electrical and heat conductive. The attorney of record does not believe that this limitation belongs in the method claims even though it is a feature of friable particles which allows

better bonding between the matrix and the particles as well as heat dissipation. Diamonds do not bond to nickel.

One of the grounds of rejection of independent Claims 1 and 10 is the Examiner's own opinion that "diamond particles" are considered to be "friable particles". This allegation is WRONG and is traversed for purposes of appeal and/or review. If the improper allegation is the basis for rejection, as it appears to be, the applicants request a citation or documented authority. Note that in Claim 10, the preferred friable synthetic particles listed exclude diamonds!

Claims 5 to 8 are dependant on Claim 1 and add method steps not taught, shown or suggested by Perry, thus, include all of the limitations of Claim 1 also.

Claim 10 is an independent method claim like Claim 1. the last four steps and the preamble are not to be found in Perry cited. Claim 10 lists the preferred grindable super abrasive particles which were found to be heat conductive and electrically conductive which produce superior bonding of the particles as well as superior cooling of the blade.

Perry does not even consider such grindable super abrasive particles because they are softer than diamonds. Thus, Perry cannot grind and balance his blade and must use two plating baths as well as post operation steps shown in Figs. 15 and 16 of Perry as cited.

Claims 11 to 13 add steps not shown or suggested by Perry. The added steps were intended to show that the sides of the blade could be made smooth or electro polished depending on the customer's preference and specification for the completely novel blade made by a novel method!

The Examiner rejects Claims 2 to 4 and 11 under 35 USC 103(a) on Perry in view of Ishizuka. The Claims 2 to 4

are dependent from Claim 1 and add method steps not shown or suggested in Perry. Any method taught by Ishizuka does not employ any of the method steps of Claim 1 less alone the steps called for in Claims 2 to 4.

As can best be determined, the method used by Ishizuka places layers of super abrasive particles on the blade or drill or base and subsequently bonds the particles so placed on the base. This requires multiple plating or bonding steps not fully explained. See Figs. 2-5 for layers. Clearly the particles are not friable nor are they grindable, thus, teach away from Claims 1 to 4.

Claim 11 is dependent from allowable Claim 10 and adds two balancing and truing steps not shown or suggested in Perry or Ishizuka!

Claim 9 is rejected on 35 USC 103(a) as being unpatentable over Perry in view of Haack.

Claim 9 is dependent from Claim 6 and independent Claim 1. Haack is cited for Cubic Boron Nitride (CBN) which is a substitute for diamonds in grinding wheels (see Col. 1, lines 5-10) of a size between 0.005 inches and 0.009 inches. One micron is equal to $39.37 \text{ inches} \div 10^6$.

Since one micron is $.00003937$ ($39.37/10^6$) inches, forty microns = $.0015748$ inches and seventy-five microns \approx $.003$. Thus, the cited range of particles is smaller than preferred embodiment Claim 9!

Applicants traverse the apparent allegation that Haack or Perry teach "friable Cubic Boron Nitride" which is softer by nature than crystal CNB or crystal diamonds.

One definition for friable is that it is grindable. The CBN and diamonds in the cited art are by definition super hard and not grindable.

Claims 1 to 13 are now in this application in a form which distinguishes over the cited and the prior art.

The present inventors did not invent friable CBN, but did discover that it could be used in singulation saw blades. Also they discovered they could make saw blades with one continuous plating operation. Further, they discovered that they could grind at least one side of their blade to provide parallelism and high speed balance without having to perform run-in steps. Not only is the blade made cheaper, but it cuts (singulation) faster and is self-cleaning. This fact is set forth in the Field of the Invention (page 1, lines 1 to 7) and the preamble of the claims. The prior art is NOT capable of doing this!

Amended Claim 4 overcomes the 35 USC 112 objection.

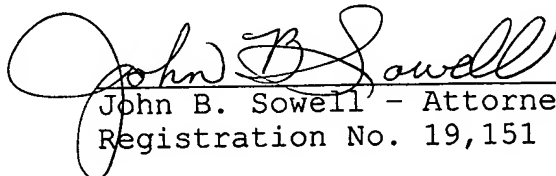
A new set of Claims is attached.

Marked up Claim 4 showing changes made is attached.

A petition for extension of time of two months is attached.

This application is in condition for allowance and such action is respectfully requested.

Respectfully submitted,


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MARKED UP VERSION SHOWING CHANGES MADE

4. (Amended) The method as set forth in claim 3 wherein the step of electro polishing the outside diameter exposes up to fifty percent of [the super abrasive] said friable particles.